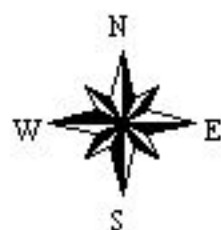


LEGEND

Powhatan Creek Watershed	Proposed RPA Extension	Priority Regional Stormwater Management Sites	Proposed Conservation Areas	Undeveloped Land
Subwatershed Boundary	Priority Retrofit Sites	Potential Retrofit Sites ID	Conservation Area ID	Low Density Residential
Rpa	Catchment Boundaries	Catchment Boundaries ID	Bald Eagle Nest	Medium Density Residential
Rpa buffer	Hydrology	Catchment Boundaries ID	Blue Heron Colony	High Density Residential
Roads	Potential Stream Rehabilitation Area	Catchment Boundaries ID	RTE Plants	Mixed Use
			Historical Points of Interest	Limited Industry/Business
				Rural

Powhatan Creek Watershed Subwatershed 207

1500 0 1500 3000 Feet



Subwatershed No. 207 (UPPER CHISEL RUN)

OVERALL PROGNOSIS:

The Upper Chisel Run has experienced a great amount of development and is currently classified as **IMPACTED**. RTE populations are largely absent in the subwatershed and stream habitat scores are only Fair/Good. Additionally, current RPA protection is limited (only 2% of subwatershed area) and wetlands are of low quality.

See Figure

Drainage Area: 3.2 sq. miles (2,051 acres)

Land Use in Subwatershed 207

	<i>Percentage</i>	<i>Subwatershed Category</i>
2000 Impervious Cover	16.4 %	Impacted
Future impervious cover (with buildout)	21.7 %	Impacted
Target Watershed Classification		Impacted

Developable area in subwatershed: 392.1 acres or 19% of subwatershed area

Conservation Areas in 207

No surveyed RTE species.

Contiguous forest areas: No significant contiguous forest areas.

Wetland areas: Least trillium commonly associated with stream-side seeps, but channel incision has noticeably reduced the quality of these micro habitats in the Upper Chisel Run.

Beaver dam complexes: Extensive old and new beaver activity just upstream of Route 199.

Stream Conditions in 207

<i>Table 207-1. General Stream Condition in Subwatershed 207</i>		
<i>Stream Quality</i>	<i>Description</i>	<i>Rank</i>
<i>Fair</i>	<i>good candidate for restoration</i>	<i>8 of 11</i>

Powhatan Creek Watershed Management Report

Habitat assessment: Stream assessment evaluation indicates that stream reaches in the Upper Chisel Run are in the Fair range. The stream reaches exhibited impacts related to an increase in impervious cover. These impacts included a reduction of the in-stream habitat quality, an increase in sediment transport and deposition, channel widening and incision, and streambank instability.

Stormwater Management in 207

Divided into eight catchments, this subwatershed is also highly developed-a candidate for stream restoration. Primary stormwater strategies include the use of stormwater management per the current James City County standards for new development in combination with stormwater retrofitting. Catchments that are fully or almost fully developed may require no additional stormwater action.

Table 207-2. Priority Stormwater Retrofit Areas			
Retrofits	Type of Retrofit and Rank		Benefit
	Regional Ponds for Future Development	Stormwater Retrofit	
207-2	3 of 9	--	Regional facility to control drainage from future development as well as from existing development. This retrofit may be constructed in conjunction with rehabilitation of the stream.
207-3	--	4 of 17	Small pond to control stormwater runoff from developed land.
207-4	--	1 of 17	Pond to control unmanaged development upstream of proposed stream rehabilitation site.

Recommendations for Subwatershed 207

Aquatic Buffers

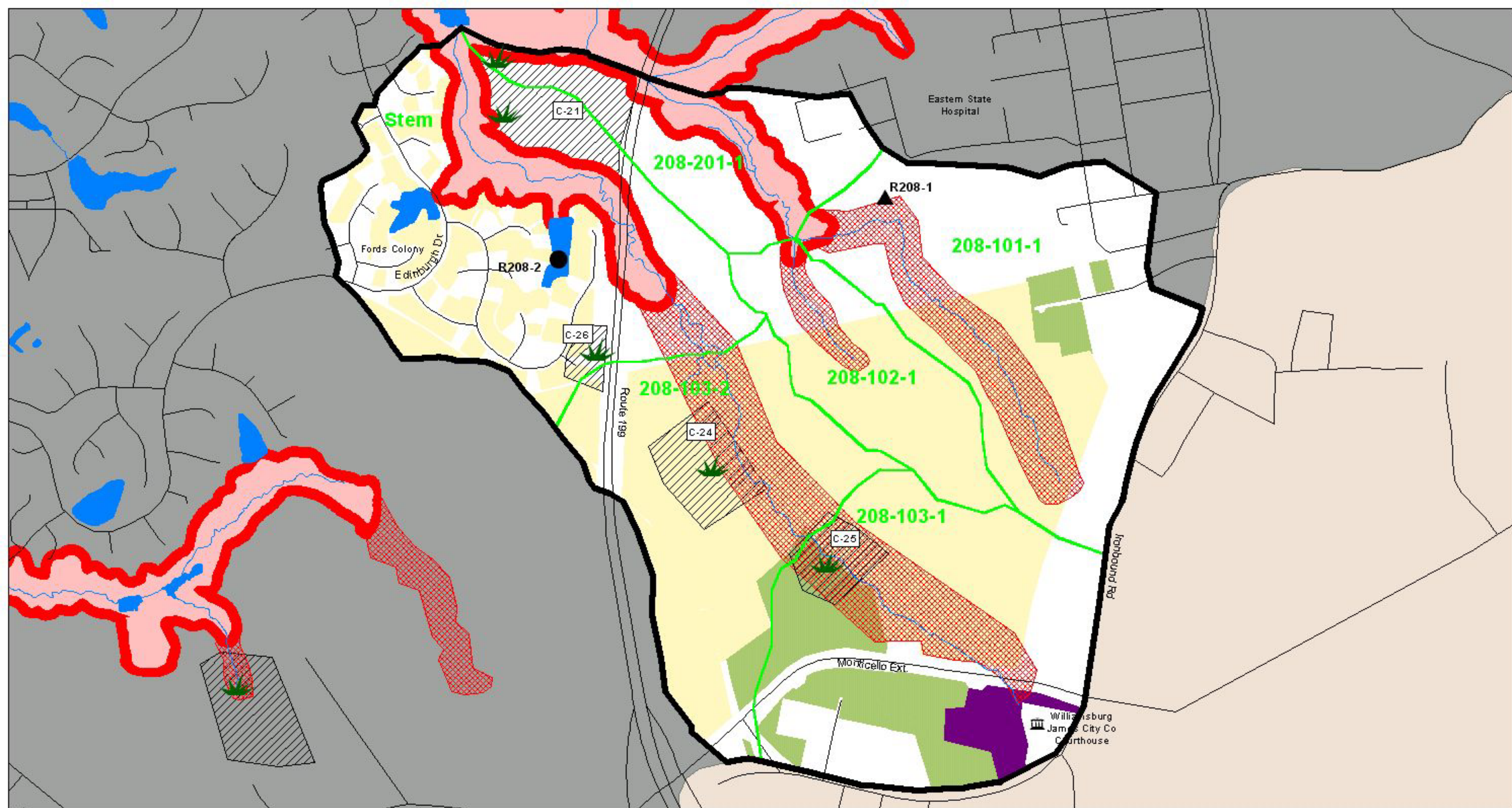
- Use the open space requirement to increase the aquatic buffers including 1st order and intermittent streams or allow for off-site protection of open space to protect identified conservation and buffer areas

Restoration

- Two potential stream restoration sites, both are associated with stormwater retrofits.

Stormwater Management

- Several stormwater retrofits are proposed to address unmanaged stormwater and to control runoff from future development.

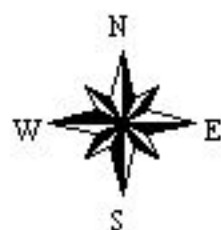


LEGEND

			Undeveloped Land

Powhatan Creek Watershed Subwatershed 208

900 0 900 1800 Feet



Subwatershed No. 208 (LOWER CHISEL RUN)

OVERALL PROGNOSIS:

Lower Chisel Run is clearly the most threatened subwatershed in all of the Powhatan Creek watershed. Currently, classified as SENSITIVE, it contains large population of RTE species (small whorled pogonia and Virginia least trillium), large contiguous forest tracts, excellent stream habitat scores and extensive floodplain wetlands. With 49% remaining developable land, this subwatershed is expected to shift to IMPACTED in the coming years, as a result of large planned developments in the headwaters, unless extraordinary watershed protection measures are implemented. Some indication of the future of Lower Chisel Run can be seen in the current condition of the Upper Chisel Run.

See Figure

Drainage Area: 1.25 sq. miles (799.8 acres)

Land Use in Subwatershed 208

	<i>Percentage</i>	<i>Subwatershed Category</i>
2000 Impervious Cover	5.8 %	Sensitive
Future impervious cover (with buildout)	15.2 %	Impacted
Target Watershed Classification		Sensitive

Developable area in subwatershed: 394.2 acres or 49% of subwatershed area

Conservation Areas in 208

Table 208-1. Priority Conservation Areas in Subwatershed 208			
<i>Conservation Area</i>	<i>Description</i>	<i>Conservation Area Ranking</i>	<i>Acquisition Ranking</i>
C-21	<i>Potential RTE, small contiguous forest</i>	<i>8 of 21</i>	<i>--</i>
C-24	<i>RTE population near New Town</i>	<i>4 of 21</i>	<i>2 of 17</i>
C-25	<i>RTE population sensitive to hydrology</i>	<i>1 of 21</i>	<i>--</i>
C-26	<i>RTE population in Ford's Colony</i>	<i>10 of 21</i>	<i>8 of 17</i>

The largest populations of small whorled pogonia and Virginia least trillium can be found along the slopes and floodplains of lower Chisel Run and have been confirmed by the Virginia Natural Heritage and our field survey. Several of these populations are located within the planned New Town development.

Powhatan Creek Watershed Management Report

Contiguous forest areas: Several tracts of contiguous forest are located along lower Chisel Run, both within and adjacent to the existing RPA.

Wetland areas: Least trillium is commonly associated with stream-side seeps. The seeps found in subwatershed 208 are in good condition.

Stream Conditions in 208

Table 208-2. General Stream Condition in Subwatershed 208		
Stream Quality	Description	Rank
<i>Excellent</i>	<i>High quality stream channels; shows minimal impacts at present; vulnerable due to future planned development</i>	<i>3 of 11</i>

Habitat assessment: Streams in Lower Chisel Run are currently in excellent condition and rank among the best in the watershed. These streams, however, are likely to be influenced by extensive planned development in the headwaters (i.e., New Town).

Stormwater Management in 208

Subwatershed 208 is divided into six catchments. It is a sensitive subwatershed and the streams received the third highest quality rating in the watershed. The proposed New Town Center is located in the lower portion of the subwatershed. Stormwater strategies for the subwatershed include the application of the Special Stormwater Criteria for Stream Protection Areas to new development, as well as minimizing hydrologic impacts to RTE species by using parallel piping to the regional pond.

Table 208-3. Priority Stormwater Retrofit Areas			
Retrofits	Type of Retrofit and Rank		Benefit
	Regional Ponds for Future Development	Stormwater Retrofit	
<i>208-1</i>	<i>2 of 9</i>	<i>--</i>	<i>Potential regional facility to treat stormwater runoff from uncontrolled development, as well as any potential future development.</i>
<i>208-2</i>	<i>--</i>	<i>8 of 17</i>	<i>Retrofit of wet pond to provide channel protection.</i>

Powhatan Creek Watershed Management Report

Recommendations for Subwatershed 208

Conservation Areas

- Acquisition or easement of lands associated with rare plant species (C-24, 25, and 26).

Better Site Design

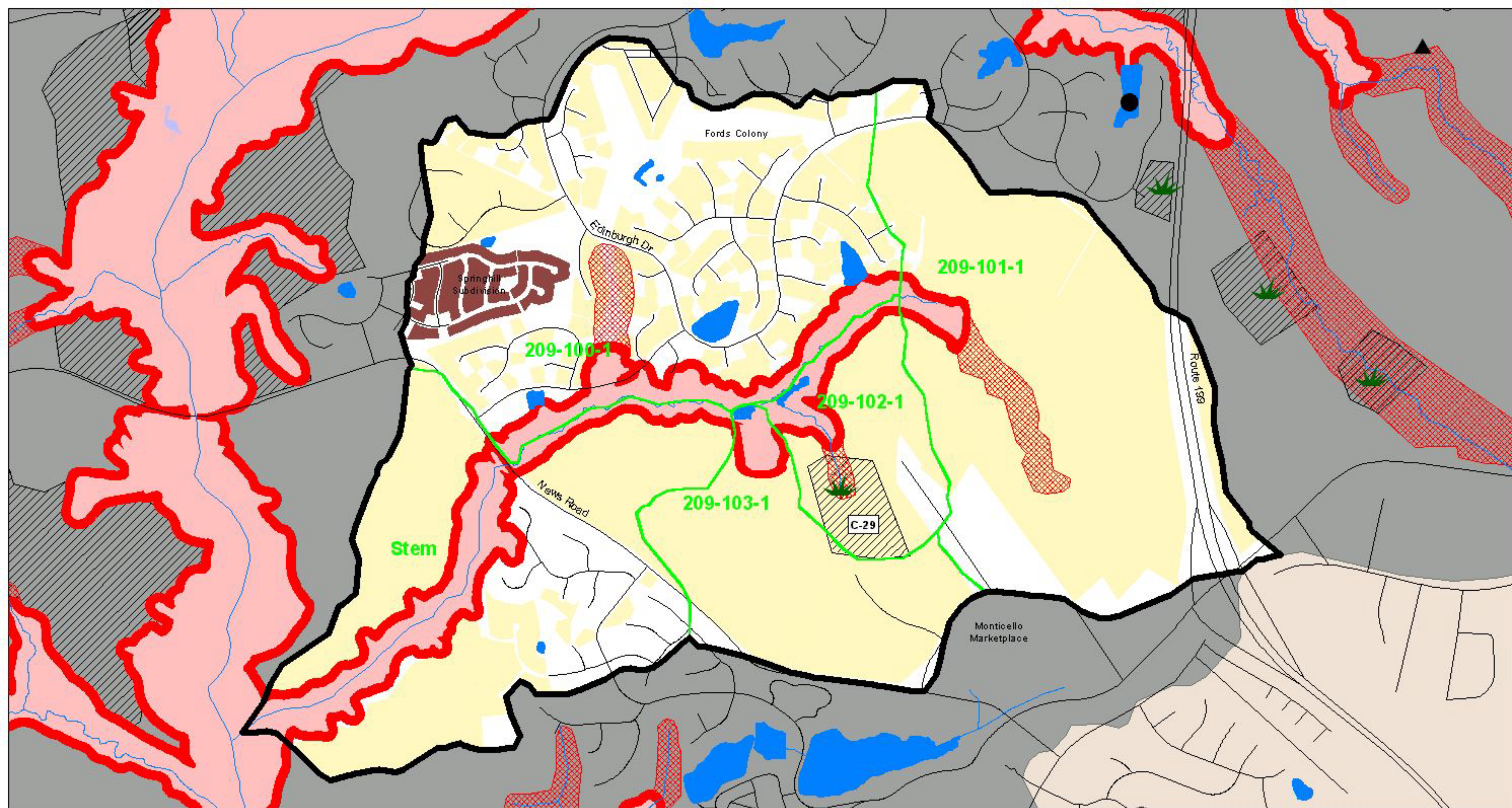
- The use of better site design to reduce the amount of impervious cover. These techniques reduce the amount and frequency of stormwater runoff that adversely impact streams.

Forest Retention

- Retain as much forest cover as possible by minimizing clearing and grading and reducing the development footprint.

Stormwater Management

- The use of Special Stormwater Criteria to minimize the impacts of new development on natural channels and to rare wetland plant species. One option is to pipe frequent channel erosion causing storms down to a regional facility.

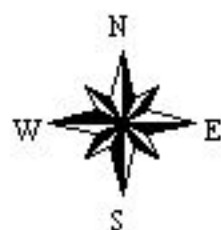


LEGEND

Powhatan Creek Watershed	Proposed RPA Extension	Proposed Conservation Areas	Undeveloped Land
Subwatershed Boundary	Priority Regional Stormwater Management Sites	Conservation Area ID	Low Density Residential
Rpa	Priority Retrofit Sites	Bald Eagle Nest	Medium Density Residential
Rpa buffer	Potential Retrofit Sites ID	Blue Heron Colony	High Density Residential
Hydrology	Catchment Boundaries	RTE Plants	Mixed Use
Roads	Catchment Boundaries ID	Historical Points of Interest	Limited Industry/Business
	Potential Stream Rehabilitation Area		Rural

Powhatan Creek Watershed Subwatershed 209

1000 0 1000 2000 Feet



Subwatershed No. 209

OVERALL PROGNOSIS:

This subwatershed is classified as **SENSITIVE**, and is a fine example of a high quality headwater streams in the watershed, as indicated by its excellent stream habitat scores, expansive floodplain wetlands, and contiguous forests. However, the subwatershed is under considerable development pressure. Impervious cover has increased by 19% in the last two years, and almost 50% of the remaining area of the subwatershed could be developed under current zoning. Consequently, in the absence of extraordinary watershed management efforts, it is likely that this subwatershed will shift into the **IMPACTED** category within the next decade.

See Figure

Drainage Area: 1.69 sq. miles (1,083.2 acres)

Land Use in Subwatershed 209

	<i>Percentage</i>	<i>Subwatershed Category</i>
2000 Impervious Cover	5.3 %	Sensitive
Future impervious cover (with buildout)	12 %	Impacted
Target Watershed Classification		Sensitive

Developable area in subwatershed: 521.8 acres or 48% of subwatershed area

Conservation Areas in 209

<i>Table 209-1. Priority Conservation Areas in Subwatershed 209</i>			
<i>Conservation Area</i>	<i>Description</i>	<i>Conservation Area Ranking</i>	<i>Acquisition Ranking</i>
C-29	<i>RTE population near Jesters Lane, sensitive to hydrological changes</i>	<i>6 of 21</i>	<i>4 of 17</i>

Presence of RTE species: Some potential based on proximity to other populations in adjacent subwatershed (208-Lower Chisel Run).

Contiguous forest areas: Yes, some small forest tracts are located outside of the RPA.

Wetland areas: Several high quality wetlands are located in the floodplain and are within the RPA.

Beaver dam complexes: There is a moderate amount of complexes that have caused some inundation in the upper reaches of the stream.

Powhatan Creek Watershed Management Report

Stream Conditions in 209

<i>Table 209-2. General Stream Condition in Subwatershed 209</i>		
<i>Stream Quality</i>	<i>Description</i>	<i>Rank</i>
<i>Excellent/Good</i>	<i>Intact forested stream valleys present; vulnerable to future planned development</i>	<i>4 of 11</i>

Habitat assessment: Stream assessment evaluation indicates that stream reaches in this subwatershed are in currently in excellent condition, and rank second among all the subwatersheds within the watershed.

Stormwater Management in 209

Subwatershed 209 is divided into 5 catchments. The streams in Subwatershed 209 are of high quality, but the subwatershed is under considerable development pressure, including a portion of the proposed New Town development. Primary stormwater strategies include the use of on-site stormwater management and Special Stormwater Criteria (SSC) to minimize the impact to recommended conservation areas.

Recommendations for Subwatershed 209

Land Conservation

- Attempt to keep the watershed in the sensitive category. Perhaps by establishing a subwatershed impervious cover cap of 9 %.
- Concentrate required open space along streams and wetlands.
- Allowances in the zoning to cluster down - maintaining the same density. This would increase the amount of land left in the natural condition.

Stormwater Management

- The use of Special Stormwater Criteria to minimize the impacts to the C-29 Conservation Area.